

REMARKS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-13 are pending in the application, Claims 1-5 and 11-13 are withdrawn from consideration; and Claims 6, 7, 9, and 10 are amended by the present amendment. Support for the amended claims can be found in the original specification, claims and the drawings.¹ Thus, no new matter is presented.

In the outstanding Official Action, the specification was objected to because of minor informalities; Claim 6 was rejected under 35 U.S.C. § 102(b) as anticipated by Kano et al. (JP 59-103321, hereinafter “Kano”); Claim 7 and 8 were rejected under 35 U.S.C. §103(a) as unpatentable over Kano et al. in view of Amada et al. (U.S. Patent No. 6,449,830, hereinafter “Amada”); and Claims 9 and 10 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant acknowledges with appreciation the indication of allowable subject matter. However, since Applicant considers that amended independent Claim 6, from which Claims 9 and 10 depend, defines patentable subject matter, Claims 9 and 10 are presently maintained in dependent form.

In response to the objections to the specification, the “Cross Reference to Related Document” paragraph is added, and the Title is amended to recite to read “A Method of Producing a Helical Coil Chip”, as recommended in the outstanding Official Action.

Accordingly, Applicant respectfully requests that the outstanding objections to the specification be withdrawn.

¹ See e.g., specification at Figs. 2A-3K.

In the outstanding Official Action, independent Claim 6 was rejected under under 35 U.S.C. § 102(b) as anticipated by Kano. Applicant respectfully submits that amended independent Claim 6 states novel features not taught or rendered obvious by the applied references.

Independent Claim 6 relates to a method for producing a helical coil chip. The method includes, *inter alia*, a step of forming a plurality of wires extending parallel to each other with predetermined intervals on an upper surface and a lower surface of a substrate. Then the substrate is cut in a direction different from the from the direction in which the plurality of wires extend, so as to cut the substrates at a predetermined length into a plurality of substrates. The cut substrates are then reconstructed using adhesive and a plurality of supplemental members by arranging the opposed cut surfaces to face upward and downward on the collective substrate. A plurality of additional wires are then formed by forming a metal film and processing the formed metal film using a thin film processing means, the plurality of additional wires extending parallel to each other and having a length equal to the thickness of the substrate plus the thickness of each of the plurality of wires formed on the upper and lower surfaces of the substrate. Each of the plurality of additional wires connects end portions of each of the plurality of wires formed on the upper and lower surfaces of the substrate that pass through the thickness of the collective substrate.

Specifically, amended Claim 6 recites, *inter alia*, a method of producing a helical coil chip comprising:

forming a plurality of additional wires by forming a metal film and processing thus formed metal film by thin film processing means, which [plurality of additional wires]... extend... on the upper and lower surfaces of said collective substrate

wherein each of said plurality of additional wires connects end portions of each of said plurality of wires formed on the upper and lower surfaces of said substrate that pass through the thickness of said collective substrate.

Turning to the applied reference, Kano describes a method of manufacturing a coil chip. Kano describes forming a plurality of slender through-slits (11) in parallel with a specified interval to an insulating substrate (10), and depositing a metal layer (12) on a front surface (14) and rear surface (15) of the substrate (10) and on the internal surface (13) of the slits (11).² Then, the metal layer (12) is left, as is, for connecting internal surfaces (13) of slits, and the substrate is immersed into the ferric sulfate solution in order to remove the unwanted layer (12), leaving only the layer (12) which will become the coil pattern (16). Finally, the substrate (10) is cut along the slits (11) and a coil where a pattern (16) is formed at the front and rear sides through the internal surface (13) of a slit at both ends can be obtained.

However, Kano fails to describe how the metal layer (12) is maintained as is. Specifically, when the size of a coil chip is reduced, it is possible to form a metal layer (12), but it becomes impossible or remarkably difficult to maintain that metal layer (12) as it is, and to form a proper photo-resist layer to cover the metal layer (12) to protect the metal layer from the etchant for the metal. If the width of the slit is made large, it may become possible to produce the small size coil chip, but it is not possible to form the large width slit onto a thin substrate with high precision.

Accordingly amended independent Claim 1 is directed to a method for manufacturing a small size coil chip. Specifically, amended independent Claim 6 recites, *inter alia*, 1) the plurality of wires are formed on upper and lower surfaces on the substrate, 2) the substrate is cut in a direction different from the direction along which the plurality of wires extend so as to make the cut substrate, and 3) the plurality of additional wires are formed on the opposite cut surfaces of the cut substrate by forming a metal film and processing thus formed metal

² Kano, Abstract.

film by thin film processing means. Kano fails to teach or suggest the above noted claimed process steps recited in amended independent Claim 6.

Further, in a case that the Teflon or material mainly comprising vinylbenzyl is used as a core material to obtain a high Q characteristic, and the size of manufactured coil chip is 1mm or less, when the insulating substrate is cut the divided substrate made of Teflon or the like becomes deformed by stress caused from cutting operation.

Thus, it is remarkably difficult to reliably form the through-hole type slit onto the substrate, and it is not possible to stack the divided substrates, as shown in Fig. 6, except for when the size of chip coil is effectively large. Kano, therefore, is directed to producing a coil chip having a low Q and large size coil chip. In contrast the present claims are directed to a method for manufacturing a coil chip having a high Q and small size coil chip. The steps recited in the present claims are presented to address manufacturing shortcomings with the deformation of the cut substrate, Kano fails to teach or suggest manufacturing steps for addressing the problems encountered in producing a small chip in his description.

Therefore, Applicant respectfully submits that Kano fails to teach or suggest forming the plurality of wires on upper and lower surfaces on the substrate, cutting the substrate in a direction different from the direction along which the plurality of wires extend so as to make the cut substrate, and forming the plurality of additional wires on the opposite cut surfaces of the cut substrate by forming a metal film and processing thus formed metal film by thin film processing means, as recited in amended independent Claim 6.

Accordingly, Applicant respectfully requests that the rejection of Claim 6 under 35 U.S.C. § 102(b) be withdrawn.

As discussed above, Kano fails to teach or suggest various steps recited in amended independent Claim 6. Likewise, Amada fails to remedy this deficiency, and therefore none of the cited references, neither alone, nor in combination, teach or suggest Applicant's Claims 7

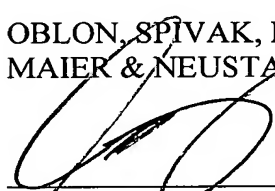
and 8, which include the above distinguished features by virtue of dependency. Therefore, the Official Action does not provide a *prima facie* case of obviousness with regard to any of these claims.

Accordingly, Applicant respectfully requests that the rejection of Claims 7-8 under 35 U.S.C. § 103 be withdrawn.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 6-10 is patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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